

WHAT IS CLAIMED IS:

1 1. An isolated UCP2 polypeptide, said UCP2 polypeptide comprising at
2 least 164 consecutive amino acid residues of the amino acid sequence set forth in SEQ. ID.
3 NO: 1, said consecutive amino acid residues comprising an alanine at amino acid residue 55
4 and a threonine at amino acid residue 219 of SEQ. ID. NO: 1.

1 2. The isolated UCP2 polypeptide in accordance with claim 1, wherein
2 said UCP2 polypeptide has the amino acid sequence set forth in SEQ. ID. NO: 1.

1 3. The isolated UCP2 polypeptide in accordance with claim 1, wherein
2 said UCP2 polypeptide is encoded by the nucleic acid sequence set forth in SEQ. ID. NO: 2.

1 4. An isolated nucleic acid that encodes a UCP2 polypeptide, wherein the
2 codon for amino acid residue 55 (Ala) is a member selected from the group consisting of
3 GCT, GCC, GCA and GCG, and the codon for amino acid residue 219 (Thr) is a member
4 selected from the group consisting of ACT, ACC, ACA and ACG.

1 5. The isolated nucleic acid that encodes a UCP2 polypeptide in
2 accordance with claim 4, wherein said codon for amino acid residue 55 is GCC.

1 6. The isolated nucleic acid that encodes a UCP2 polypeptide in
2 accordance with claim 4, wherein said codon for amino acid residue 219 is ACT.

1 7. The isolated nucleic acid that encodes a UCP2 polypeptide in
2 accordance with claim 4, wherein said UCP2 polypeptide has the amino acid sequence set
3 forth in SEQ. ID. NO: 1.

1 8. The isolated nucleic acid that encodes a UCP2 polypeptide in
2 accordance with claim 4, wherein said nucleic acid has the nucleic acid sequence set forth in
3 SEQ. ID. NO: 2.

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1 9. An isolated nucleic acid that encodes the UCP2 polypeptide of claim 1,
2 wherein a codon for amino acid residue 55 (Ala) is a member selected from the group
3 consisting of GCT, GCC, GCA and GCG, and a codon for amino acid residue 219 (Thr) is a
4 member selected from the group consisting of ACT, ACC, ACA and ACG.

1 10. An isolated nucleic acid that encodes a UCP2 polypeptide in accordance
2 with claim 4, wherein said nucleic acid is operably linked to a promoter.

1 11. An isolated nucleic acid that encodes a UCP2 polypeptide in accordance
2 with claim 10, wherein said nucleic acid is contained in an expression vector.

1 12. An expression vector containing the nucleic acid of claim 4 in operative
2 association with a regulatory element that controls expression of the nucleic acid in a host
3 cell.

1 13. A cell comprising a recombinant nucleic acid in accordance with claim
2 4.

1 14. A cell in accordance with claim 13, wherein said recombinant nucleic
2 acid is in operative association with a regulatory element that controls the expression of the
3 nucleic acid in a host cell.

1 15. A method of making a UCP2 polypeptide, said method comprising:
2 introducing a nucleic acid of claim 4 into a host cell or cellular extract;
3 incubating said host cell or cellular extract under conditions such that
4 said UCP2 polypeptide is expressed in said host cell or cellular extract; and
5 recovering said UCP2 polypeptide from said host cell or cellular extract.

1 16. A method for diagnosing body weight disorders, said method
2 comprising detecting in a patient sample, the level of:

- 3 a. an mRNA transcribed from a nucleic acid encoding a UCP2
4 polypeptide having the amino acid sequence set forth in SEQ. ID.
5 NO: 1;
6 b. a UCP2 polypeptide having the amino acid sequence set forth in
7 SEQ. ID. NO: 1; or
8 c. a UCP2 polypeptide encoded by the nucleic acid sequence set forth
9 in SEQ. ID. NO: 2.

1 17. The method in accordance with claim 16, wherein the level is induced
2 in overweight individuals.

1 18. The method in accordance with claim 16, wherein the level is repressed
2 in overweight individuals.

1 19. The method in accordance with claim 16, wherein the level is induced
2 in underweight individuals.

1 20. The method in accordance with claim 16, wherein the level is repressed
2 in underweight individuals.

1 21. A method of treating obesity in a mammal, said method comprising
2 administering to said mammal a therapeutically effective amount of a UCP2 polypeptide and
3 a pharmaceutically acceptable carrier.

1 22. A method of identifying a modulator of UCP2 gene expression, said
2 method comprising:
3 providing a cell comprising a UCP2 promoter operably linked to a
4 reporter gene;
5 contacting said cell with a test compound that is a potential modulator
6 of UCP2 gene expression; and
7 detecting the expression level of the reporter gene, wherein an increase
8 or decrease in reporter gene expression in the presence of the test compound compared to

9 reporter gene expression in the absence of the test compound indicates that the test
10 compound is a modulator of UCP2 gene expression.

1 23. The method according to claim 22, wherein the test compound causes
2 an increase in reporter gene expression.

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